



Nature Study

Each Friday morning, you will go through two of our nature cards. They are labeled in the upper right corner with the corresponding week. These are short, factual cards with images to help your child become familiar with objects in the natural world.

As you progress through our sessions, you may find it handy to keep your past nature cards in a binder for easy reference when your children come across a familiar object. These seeds you are planting will grow into a wonderful garden of knowledge for your children in years to come.

As you explore nature outside your home, watch and listen for newly discovered delights. Most of all, remember...

"Point to some lovely flower or gracious tree, not only as a beautiful work, but as a beautiful thought of God."

~ Charlotte Mason

Nature Study



Coal 1

- Coal is a type of black or dark brown rock formed from ancient, long-buried plants that were covered by layers of dirt and water. Over time, the remains of these plants were shaped by pressure and heat, changing them into coal.
- Coal can be found in "coal seams"

an accumulation of coal underground that can stretch on for up to 920 miles!

- Coal can be burned because it contains a rich amount of carbon, and it is often used as fuel to keep fires going and to produce electricity.
- During the Industrial Revolution, coal-powered trains were invented, which greatly drove up both the use of and the demand for coal.
- In modern times, coal still powers much of our infrastructure- in 2020 alone, coal was used to fuel about $\frac{1}{3}$ of global electricity, and $\frac{1}{4}$ of its primary energy.



Iron Ore 1

- Iron ore is a type of mineral or rock that is typically grey, yellow, rust red, or deep purple. There are many different kinds of iron ore, including magnetite, limonite, siderite, and goethite.
- Most iron ore is believed by scientists to have been formed inside stars. When large stars die and explode, they scatter

iron into space. Over time, some of this iron became part of the Earth.

- Iron ore is extracted to make the metal known as iron, and it can also be used to make steel, which is made from a combination of iron ore, coal, and limestone.
- During the Industrial Revolution, steel production became much more accessible because of a new type of furnace. Because it was more durable than iron, this steel fueled progress and was used to make railways, bridges, tunnels, and more.



Copper Ore 2

- Copper ore is a greenish-blue mineral from which copper can be extracted. Copper is a soft, malleable red-orange metal.
- Much like iron ore, copper ore is created inside very large stars that then explode, scattering copper across the cosmos.

- Copper is the earliest metal to have been smelted, or melted down, for human use, and has been used in this manner since as early as 5,000 B.C.
- Copper was very useful in the Industrial Revolution, as it conducts both heat and electricity very well. Because of this, the material was often used in trains and in factory machinery.



Tin 2

- Tin is a soft, gray-colored metal created when the mineral cassiterite is melted down and purified, removing its oxygen.
- Bronze is created by combining tin and copper, which humans discovered around 3,000 B.C.

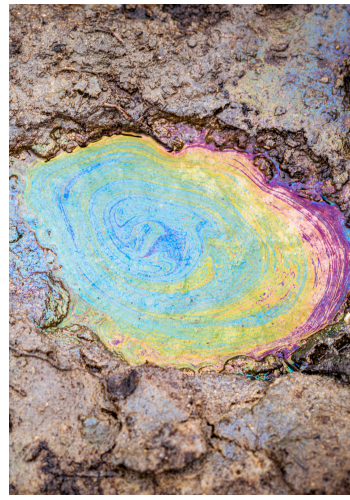
- Pewter is also made with tin and copper, along with other materials like antimony and bismuth.
- In 600 B.C., humans finally learned how to produce pure tin, rather than needing to combine it with other materials.
- Because tin is fairly non-toxic, it became a popular material in cans, which are used as a means of preserving food. The tin can first came into use in 1810, near the mid-Industrial Revolution.



Lead 3

- Lead is a type of heavy metal that is soft and easy to mold. Though it looks silver when first cut into, when exposed to the air, it eventually turns a deep, matte grey.
- Lead is often extracted from galena, a type of ore that can also produce silver.

- Because galena ore can produce silver, the Romans were motivated to begin mining it, and as a consequence, they also began to use lead in many different products.
- Lead doesn't need much heat (compared to other metals) for it to melt; this fact, combined with its softness, made it a very popular and affordable material during the Industrial Revolution.
- Unfortunately, what was unknown at the time was that lead is a highly toxic material. Many who were exposed to it in factories or through household items like lead paint or pipes grew sick, which eventually led to regulations being passed.



Petroleum 3

- Petroleum, which is also called crude oil, is a type of yellow-black liquid that can be found underground, often contained in soft rocks like limestone or sandstone.
- Petroleum was formed through a process that took millions of years, as ancient plant and animal matter

(such as algae and plankton) slowly decayed while it was buried under the earth.

- Because it took so long to form, we only have a finite amount of oil in the world (making it a fossil fuel). For this reason, it is an incredibly valuable resource.
- During the late Industrial Revolution, oil became a popular means of lighting lamps. This created a high demand, and oil wells were dug all over the world to extract petroleum, leading to a booming oil industry.



Timber 4

- Timber, also known as lumber, is wood that has been shaped into even sizes, like wood planks or beams, making it useful for construction.
- Timber can come from all kinds of wood, though some of the most popular are white pine and red pine, which are typically low in cost.

- In 1593, the first wind-powered sawmill was created, making it 30 times faster to convert wood into timber planks.
- During the Industrial Age, timber was often used for construction, and wood was also used to fuel fires, especially fires used to propel steamboats or to smelt iron, which was in high demand.
- It is thought that 5-6 million acres of forest were cleared during the 1800s to keep up with the need for timber.



Clay 4

- Clay is a material found in the soil that is composed of dirt and clay minerals. It is typically white, but can also be red or brown due to iron oxide.
- When wet, clay becomes soft to the touch and very easy to mold, but hardens

when exposed to heat through a process called "firing."

- Because of this, clay has been used to make pottery since the early days of humanity. It was often used to make pots with which to store food or liquids, and was also used to make the first writing tablets.
- During the Industrial Revolution, clay began to be mass-produced in factories, and found many uses in everything from bricks to tiles.



Limestone 5

- Limestone is a type of soft, porous rock from which a material called lime is extracted.
- Limestone frequently encases many fossils, which scientists study as a valuable tool for information on prehistoric creatures.

- During the Industrial Revolution, it became much easier to mine limestone, as gunpowder started to be used to blast away at the rock instead of breaking it by hand.
- Lime is used in mortar, concrete, and cement, and also during the process of creating steel, making it an important element in building.
- Additionally, limestone is used when making soda ash, which is in turn used in soap, paper, detergent, and even in the water treatment process.



Wool 5

- Wool is a white, grey, brown, or black fiber that comes from the hair of sheep.
- It is sheared off a sheep, separated by quality, then cleaned to remove sweat, dirt, and oils from the fur before it is sold.

- Wool is often spun into yarn, which has been used to make clothing for centuries, as the material is very warm and naturally water-resistant.
- During the Industrial Revolution, new machines came into widespread use that helped to spin and process wool at a much faster rate, enabling wool cloth to be mass-produced.
- This led to the textile industry growing at a rapid pace in Britain, and allowed wool to become much cheaper and more accessible as “wool mills,” or factories, blossomed.



Cotton 6

- Cotton is a type of fluffy white plant fiber that grows from a shrub that can be found in the Americas, Africa, India, and Australia.
- Cotton grows in a fluffy case around the seeds of the cotton plant as a natural protection for them.

- Cotton fiber has many uses, including in yarn, thread, and cloth. Cotton fabric is soft to the touch and breathable, which has made it a popular choice for many clothing items throughout history and in modern times.
- During the Industrial Revolution, machines such as the spinning jenny made it much easier for cotton material to be produced, leading to a skyrocket in usage and popularity.



Linen 6

- Linen is a cloth made by weaving together the fibers of the flax plant. It is a light and breathable, yet durable material.
- Linen has been used in clothing for thousands of years, including in Ancient Egypt and Mesopotamia, and it is even mentioned in the Bible.

- In 1810, linen became much more affordable due to the invention of the flax spinning machine, which helped it become more accessible to everyday people.
- Due to this increase in affordability, linen became more common during the 19th century, particularly among working-class farmers and agricultural workers.
- Their linen work shirts were often dyed blue, which is where the phrase “blue collar worker” originated.